SECTION 4

EXISTING TRAFFIC CONDITIONS

EXISTING TRAFFIC CONDITIONS

4.1 TRAFFIC ANALYSIS INTRODUCTION

A traffic analysis of the SR 28 corridor has been performed to assess the existing and future operational and safety characteristics of the roadway. The purpose of this analysis is to estimate what improvements and/or initiatives should be pursued in order to safely and efficiently accommodate existing and projected traffic volumes in the area and to provide a framework for the development of an access management plan for the corridor. Traffic volume data was collected along the study corridor to capture current traffic volumes and patterns. Projected traffic volumes were obtained from the OKI Travel Demand Model. These volumes were used to estimate the future design year (2030) peak hour traffic volumes, which were used in the capacity analyses of the SR 28 corridor. Capacity analyses were performed for five specific scenarios:

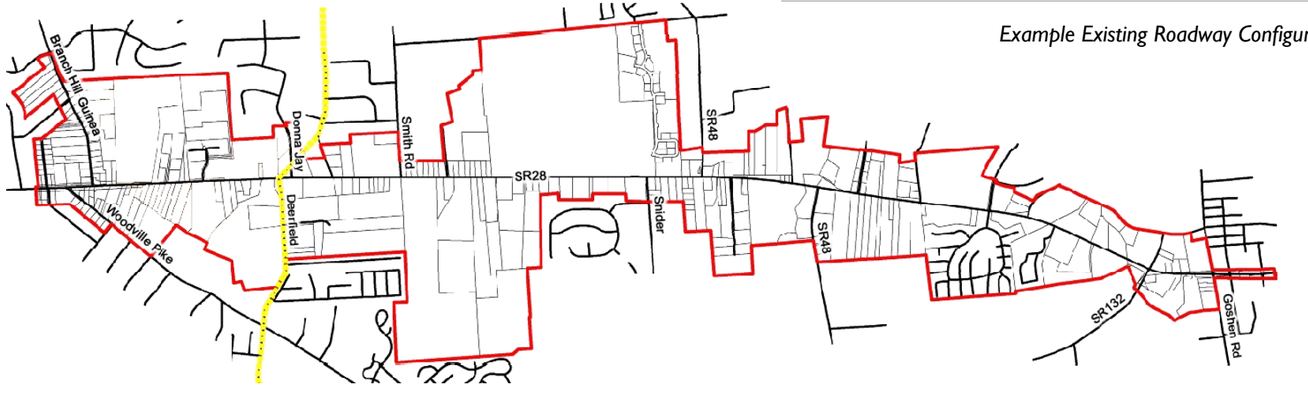
1. Existing Year (2008) Traffic – Existing Roadway Infrastructure
2. Future Design Year (2030) Traffic – Existing Roadway Infrastructure
3. Future Design Year (2030) Traffic – Improved Roadway Infrastructure
4. Future Design Year (2030) Traffic – Roadway Infrastructure necessary to accommodate projected background traffic volumes plus traffic generated by projected future land uses within the SR 28 corridor

Recommended improvements were based on analyses of crash data, capacity analyses, public input, ODOT access guidelines, and observations of traffic patterns and roadway configurations. These recommendations are outlined in Sections 5.4 to 5.6.

Example Existing Roadway Configurations

Example Existing Roadway Configurations

Existing Traffic Conditions



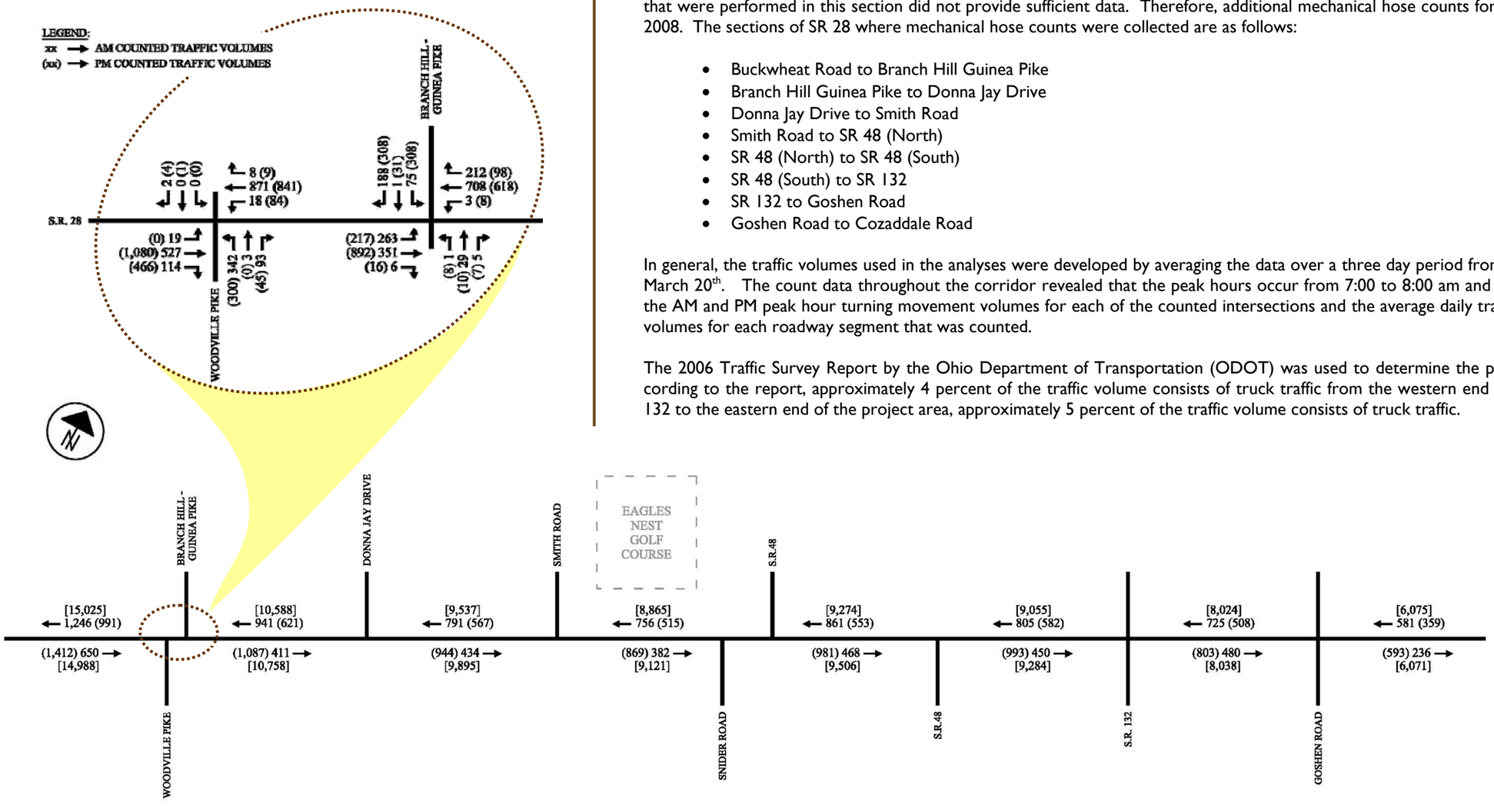


Figure 4-1: Existing Year (2008), Counted Traffic Volumes

4.2 TRAFFIC VOLUME DATA COLLECTION

In order to assess the existing traffic conditions along the SR 28 corridor, traffic volume data, general roadway geometric information, traffic control information, and crash data were collected.

Turning movement counts were performed at the intersection of SR 28 and Woodville Pike and at the intersection of SR 28 and Branch Hill Guinea Pike on March 20, 2008 from 7:00 to 9:00 am and from 4:00 to 6:00 pm. Directional mechanical hose counts were performed along sections of SR 28 from March 18, 2008 to March 24, 2008 with the exception of the section between the south leg of SR 48 and SR 132. Due to equipment problems, the initial traffic counts that were performed in this section did not provide sufficient data. Therefore, additional mechanical hose counts for this section were performed on April 3, 2008. The sections of SR 28 where mechanical hose counts were collected are as follows:

- Buckwheat Road to Branch Hill Guinea Pike
- Branch Hill Guinea Pike to Donna Jay Drive
- Donna Jay Drive to Smith Road
- Smith Road to SR 48 (North)
- SR 48 (North) to SR 48 (South)
- SR 48 (South) to SR 132
- SR 132 to Goshen Road
- Goshen Road to Cozaddale Road

In general, the traffic volumes used in the analyses were developed by averaging the data over a three day period from Tuesday, March 18th through Thursday, March 20th. The count data throughout the corridor revealed that the peak hours occur from 7:00 to 8:00 am and from 5:00 to 6:00 pm. Figure 4-1 shows the AM and PM peak hour turning movement volumes for each of the counted intersections and the average daily traffic (ADT) volumes and peak hour traffic volumes for each roadway segment that was counted.

The 2006 Traffic Survey Report by the Ohio Department of Transportation (ODOT) was used to determine the percentage of truck traffic on SR 28. According to the report, approximately 4 percent of the traffic volume consists of truck traffic from the western end of the project area to SR 132. From SR 132 to the eastern end of the project area, approximately 5 percent of the traffic volume consists of truck traffic.

4.3 EXISTING ROADWAY CONDITIONS

SR 28 within the project area is classified by the ODOT as an Urban Minor Arterial. SR 28 is a five lane roadway from the western end of the project area to a point just east of the Branch Hill Guinea intersection, where it becomes a two-lane roadway extending to the eastern end of the project area. Auxiliary turn lanes are in place at various intersections within the project area.

The legal speed limit on SR 28 is 45 mph from the western end of the project area to just east of Donna Jay Drive, 55 mph from just east of Donna Jay Drive to Snider Road, and 45 mph from Snider Road to the eastern end of the project area.

There are five existing signalized intersections within the SR 28 corridor including the SR 28 intersections with Branch Hill Guinea Pike, Woodville Pike, the north leg of SR 48, SR 132/Dick Flynn Boulevard, and Goshen Road. All other intersections within the study area are controlled by stop signs where traffic on SR 28 is not required to stop.

Auxiliary turn lanes are provided at the following locations along the SR 28 corridor:

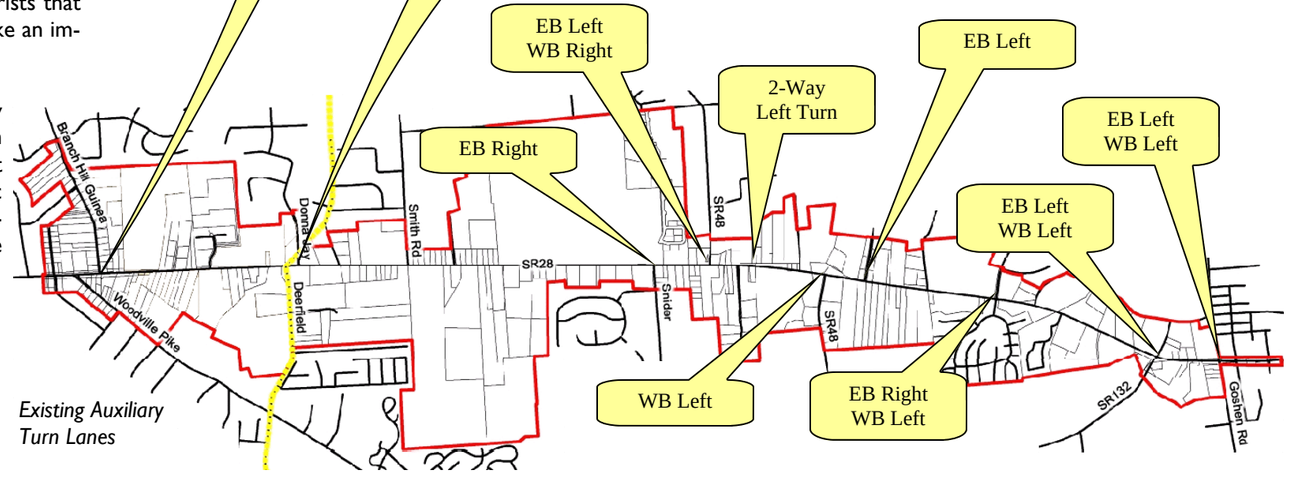
- Eastbound right-turn lane at Snider Road
- Eastbound left-turn lane and westbound right turn lane at SR 48 (North)
- Two-way-left-turn-lane between SR 48 (North) and SR 48 (South)
- Westbound left-turn lane at SR 48 (South)
- Eastbound left-turn lane at Rose Lane
- Eastbound right-turn lane and westbound left-turn lane at Country Lake Drive
- Eastbound and westbound left-turn lanes at SR 132
- Eastbound and westbound left-turn lanes at Goshen Road

Currently, the intersections of SR 28 with Woodville Pike and with Branch Hill Guinea Pike are offset by approximately 380 feet with Woodville Pike intersecting SR 28 to the west of the Branch Hill Guinea Pike intersection. In this configuration, vehicles on SR 28 that are in queue to turn left onto each of these roads store between the intersections. As such, the intersection offset limits the amount of left-turn storage space that is available at each location. Also, motorists that want to travel from Woodville Pike to Branch Hill Guinea Pike or vice-versa must turn right onto SR 28 then make an immediate left to continue in the desired direction.

Similarly, the intersections of SR 28 with Deerfield Road and with Donna Jay Drive are offset by approximately 225 feet with Deerfield Road intersecting SR 28 to the west of Donna Jay Drive. Currently, there are no left turn lanes along SR 28 in the area of these intersections. One of the problems that tends to occur at intersections that are offset as they are at this location is that vehicles on the mainline that are waiting for a gap in opposing traffic block other vehicles traveling in the same direction as the left-turning vehicle. At this location, only about 10 vehicles queued up behind the left turning vehicle will result in the blocking of the adjacent intersection, which has the potential of causing a gridlock situation.

Intersection of SR 28 with Woodville Pike and Branch Hill Guinea Pike

Intersection of SR 28 with Deerfield Road and Donna Jay Drive



Existing Auxiliary Turn Lanes

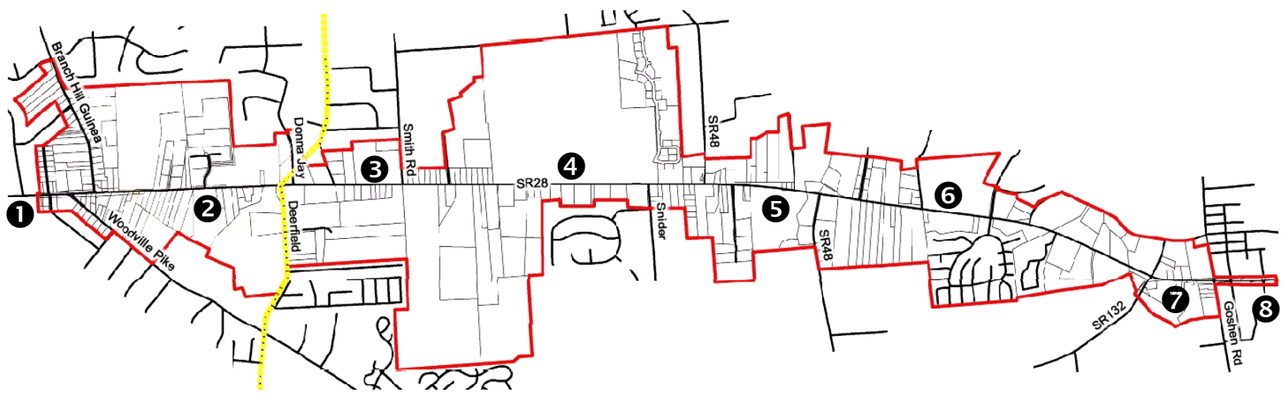
4.4 EXISTING ACCESS CONDITIONS

Currently, the majority of properties within the project area have direct access to SR 28, with very few properties being accessed by shared driveways. Some properties are served by multiple access points. An inventory of existing access points on each section of SR 28 within the project area was performed as part of this study and is shown in Table 4A.

		Length of Section (mi)	Eastbound		Westbound		Eastbound and Westbound Combined	
			No. of Access Points	No. of Access Points/mi	No. of Access Points	No. of Access Points/mi	No. of Access Points	No. of Access Points/mi
❶	**Buckwheat Road to Branch Hill Guinea Pike**	0.36	9	25	11	31	20	56
❷	**Branch Hill Guinea Pike to Donna Jay Drive**	0.68	17	25	11	16	28	41
❸	**Donna Jay Drive to Smith Road**	0.37	12	32	6	16	18	49
❹	**Smith Road to SR 48 (North)**	1.03	24	23	11	11	35	34
❺	**SR 48 (North) to SR 48 (South)**	0.40	10	25	12	30	22	55
❻	**SR 48 (South) to SR 132**	1.18	22	19	14	12	36	31
❼	**SR 132 to Goshen Road**	0.22	2	9	2	9	4	18
❽	**Goshen Road to Cozaddale Road**	0.74	6	8	4	5	10	14

Table 4A: Number of Access Points per Section - Summary

Existing Access Conditions



4.5 CRASH DATA AND ANALYSES

Crash data was provided by the Clermont County Engineer's Office. This data includes information on crashes that occurred within Clermont County from January 2005 through March 2008. The data was queried to identify crashes that occurred within the study corridor.

It should be noted that construction was completed in the fall of 2007 along SR 28 in the area of Branch Hill New Guinea Pike and Woodville Pike, which widened the roadway from a two-lane section to the current five-lane section. As a result of these roadway modifications, the crash data in this area is not representative of the current roadway configuration. Also, this section of SR 28 was under construction from February 2006 to the Fall of 2007. Therefore, the number of accidents reported in this area may differ from what has historically occurred due to the presence of the construction zone.

In order to assess the level of safety along the corridor and to identify specific locations where abnormally high accident rates have occurred, the location of each crash that was reported along the project corridor was identified. Figure 4-2 shows the locations of crashes that were reported throughout the corridor and contain summaries of the types of crashes that have occurred. In order to identify specific crash patterns, crash diagrams were prepared for each intersection where crashes were reported. These crash diagrams are shown in Appendix A. According to the data, 211 crashes were reported along the study corridor, including 29 crashes that occurred outside the official project area; 25 crashes at the intersection of SR 28 and Floyd Place/Holland Drive and 4 crashes at the intersection of SR 28 and Wood Street.

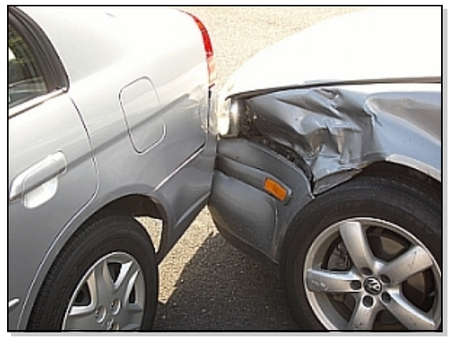
In order to determine whether or not the number of crashes reported on the SR 28 approaches to a particular intersection is higher than what should typically be expected, the methodology presented in a report titled, *Crash Base Rates for Intersections in Ohio*, dated February 2007 was used. The report presents mathematical models to estimate base crash rates on approaches to intersections with various geometric layouts, traffic control, and environmental conditions. The methodology presented in the report was used to determine the base crash rate and the standard deviation for the SR 28 approaches to intersections where crashes were reported. These statistical measures were quantified for the following crash types: rear-end, left-turn, property damage only, injury crashes, and total crashes.

In the analysis of the various crash types, the upper limit of the "normal" range was established as the base crash rate plus 2 times the standard deviation. Table A1 in Appendix A presents the statistical measures, the predicted number of crashes per year, and the actual number of crashes per year. The table also provides an indication as to whether the actual number of crashes per year is less than or equal than the predicted number (normal) or greater than the predicted number (high).

According to the analyses, a higher than normal number of crashes of various types were reported at the following locations within the study corridor:

1. SR 28 at Deerfield Road (Westbound: rear-end crashes, property damage only crashes, and total crashes)
2. SR 28 at Donna Jay Road (Eastbound: rear-end crashes)
3. SR 28 at Smith Road (Eastbound: left-turn crashes—*Note: Only one eastbound left turn crash was reported at this intersection)*
4. SR 28 at Snider Road (Eastbound: property damage only crashes and total crashes. Westbound: rear-end crashes, left-turn crashes, injury crashes, property damage only crashes, and total crashes)
5. SR 28 at SR 48 South (Eastbound: injury crashes)

The crash data for the intersections of SR 28 at Floyd Place/Holland Drive and SR 28 at Wood Street, both of which are outside the study area, are shown as additional information. A higher than normal number crashes was reported at each of these intersections. However, much of the data for the Floyd Place/Holland Drive intersection represents crashes that were reported prior to and during the SR 28 widening through this intersection. Therefore, the crash data at this intersection was determined to not be representative of current roadway conditions. Also, at the intersection of SR 28 and Wood Street, the number of westbound left turning crashes was determined to be higher than normal. However, since only one westbound left-turn crash was reported at this location, the fact that the crash rate was identified as high was not considered to be significant.



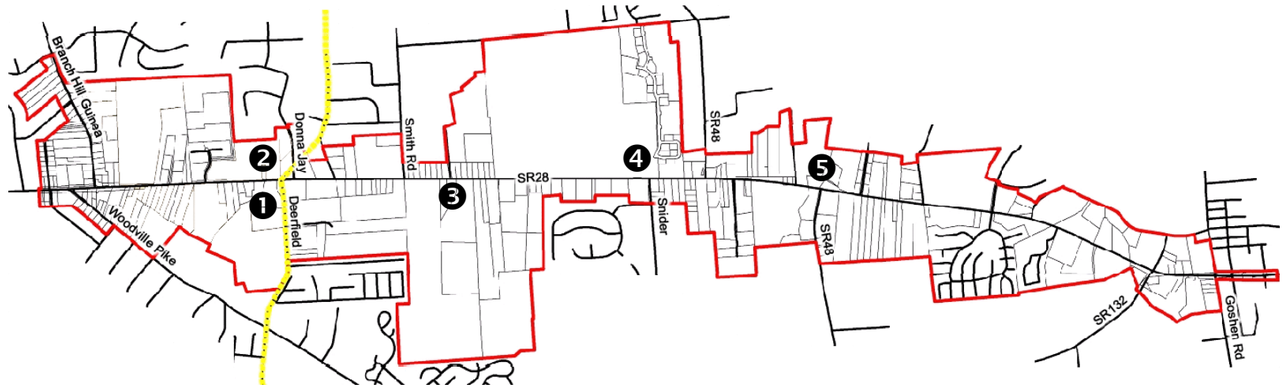
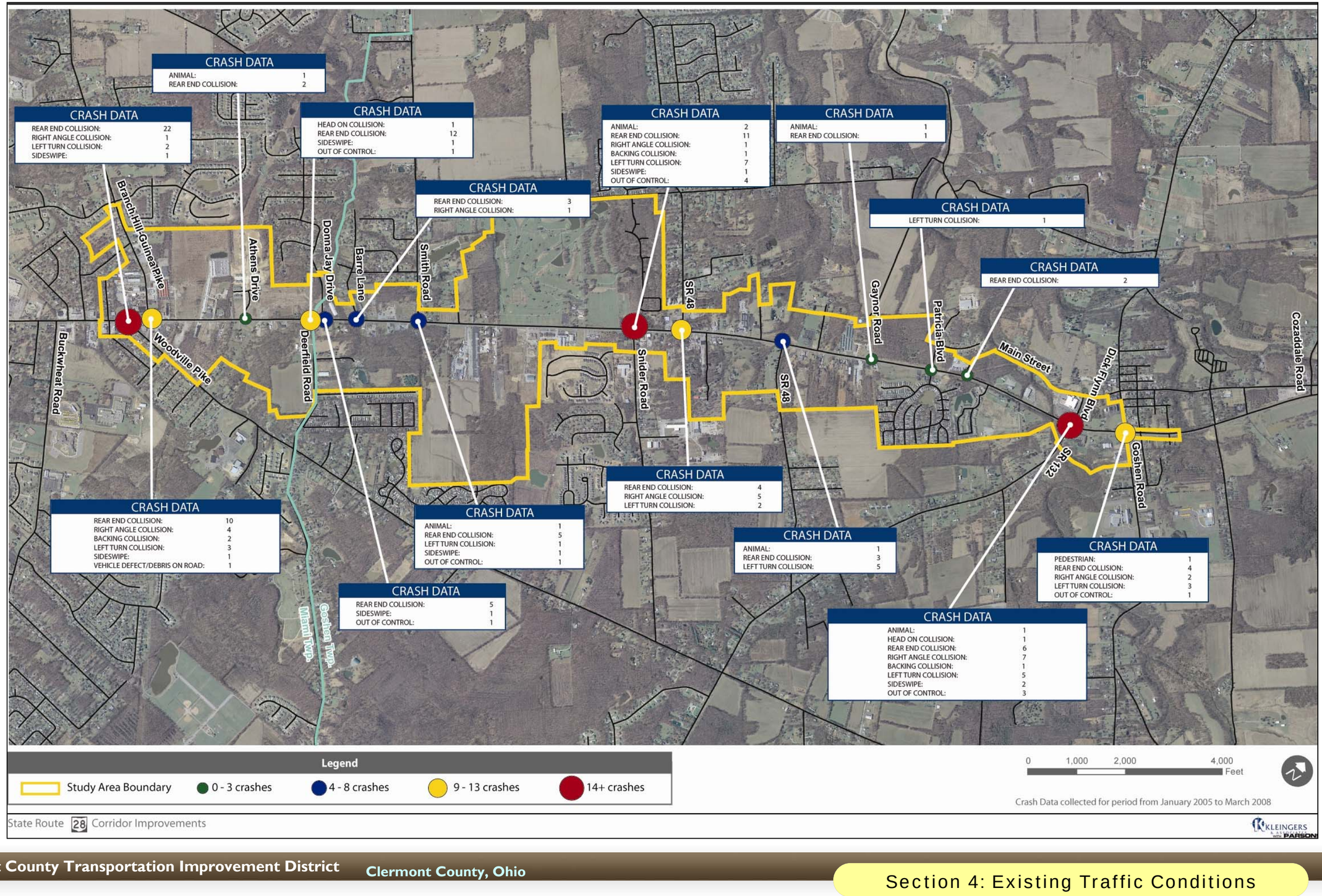


Figure 4-2: Crash Data



4.6 TRAFFIC CAPACITY ANALYSES

Capacity analyses were performed using McTrans *HCS+* capacity analysis software. This software was used to determine the level of service of the existing and proposed intersections and sections of roadway. Level of service values range from "A" (best) to "F" (failing). In accordance with the ODOT's *Policy for Applying Level of Service and Volume-to-Capacity Ratio in the Transportation Development Process,* effective February 1, 1998, intersections or sections of roadway with levels of service of "D" or worse are not considered to be operating acceptably.

Existing Conditions Capacity Analyses

(Existing Roadway, 2008 Traffic Volumes)

Existing conditions capacity analyses were performed on the existing roadway infrastructure using counted traffic volumes to assess the current operational conditions. Reports from each of the Existing Conditions Capacity Analyses are included in Appendix B.

Intersection Analyses

Intersection capacity analyses were performed at the intersection of SR 28 and Branch Hill Guinea Pike and at the intersection of SR 28 and Woodville Pike. The primary criteria for determining the level of service at an intersection is delay. Table 4B shows the calculated delays and levels of service for each intersection. Based on the analyses, both of these intersections currently operate at acceptable levels of service.

		Eastbound			Westbound			Northbound			Southbound			INT.
		LT	THRU	RT	LT	THRU	RT	LT	THRU	RT	LT	THRU	RT	
SR 28 at Woodville Pike	AM	13.7 B	15.4 B		12.1 B	18.0 B		19.2 B	12.7 B		11.7 B			17.0 B
	PM	7.3 A	31.7 C		56.5 E	11.1 B		34.1 C	17.1 B		16.5 B			26.3 C
SR 28 at Branch Hill Guinea Pike	AM	35.6 D	6.3 A		12.9 B	24.3 C		19.4 B	19.9 B		21.1 C	24.7 C		22.2 C
	PM	19.2 B	11.9 B		17.6 B	29.0 C		15.6 B	15.5 B		29.4 C	26.6 C		21.6 C

Table 4B: 2008 Existing Intersection Capacity Analyses Summary

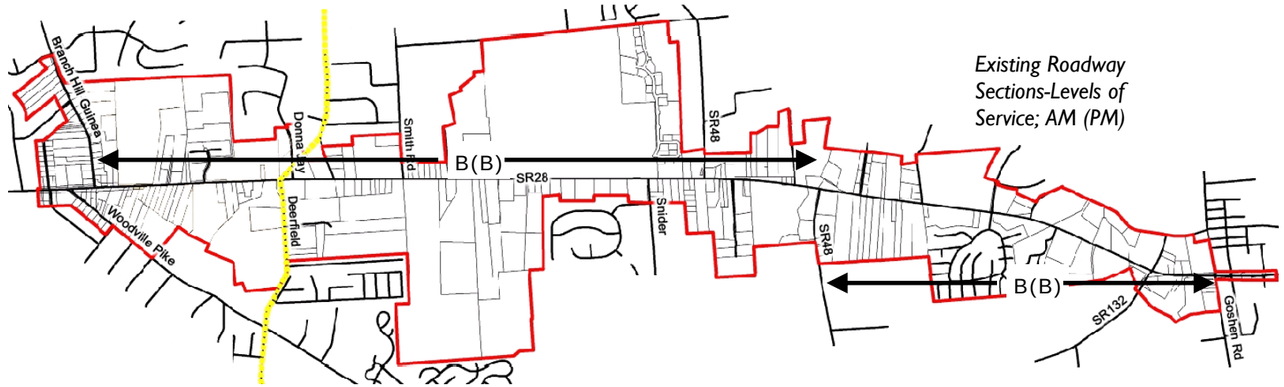
Arterial Roadway Analyses

Capacity analyses were performed on SR 28 within the project area using the Urban Streets methodology outlined in the Highway Capacity Manual. For these analyses, SR 28 was divided into two sections based on the projected 2030 OKI traffic volumes along the SR 28 corridor. These sections were established such that the projected traffic volumes throughout each section are relatively consistent. The western section extends from the end of the existing five-lane section just east of Branch Hill Guinea Pike to the south leg of SR 48. The eastern section extends from the south leg of SR 48 to Goshen Road.

According to the Highway Capacity Manual, the Level of Service (LOS) for Arterial Roadway sections is based on average travel speed through the corridor. For the existing conditions, the analyses show that both the western and eastern sections of SR 28 currently operate at acceptable levels of service. It should be noted that the volume to capacity ratio of 0.91 for the western section during the PM peak traffic period indicates that the traffic volumes are approaching the capacity of the roadway. Table 4C shows the calculated volume to capacity ratios, average travel speeds, and levels of service for each section of SR 28.

		Volume to Capacity Ratio (v/c)	Average Travel Speed (mph)	Level of Service (LOS)
Western Section SR 28 from Branch Hill Guinea Pike to SR 48 South	AM - Westbound	0.86	40.4	B
	PM - Eastbound	0.91	39.8	B
Eastern Section SR 28 from SR 48 South to Goshen Road	AM - Westbound	0.71	39.6	B
	PM - Eastbound	0.81	38.6	B

Table 4C: 2008 Existing Roadway - Arterial Capacity Analyses Summary



SECTION 5

FUTURE TRAFFIC CONDITIONS

STATE ROUTE 28 CORRIDOR IMPROVEMENTS

FUTURE TRAFFIC CONDITIONS

In order to assess the operational characteristics of the SR 28 corridor in the future design year (2030), traffic assignment plots were obtained from the Ohio-Kentucky-Indiana (OKI) Regional Council of Governments travel demand model for the years 2005 and 2030. Both of these plots are included in Appendix C. Traffic assignment plots for 2005 and 2030 were used to calculate average annual growth rates on the various sections of SR 28. These growth rates were applied to the 2008 AM peak, PM peak, and daily counted traffic volumes along SR 28 from Donna Jay Drive to the eastern end of the project area to generate the future design year traffic volumes to be used in the analyses.

When comparing the daily traffic volumes from the 2005 OKI traffic assignment plot with the 2008 counted traffic volumes on the section of SR 28 from the western end of the project area to Donna Jay Drive, the average annual growth rates for that time period were significantly higher than the average annual growth rates calculated from the 2005 and 2030 OKI traffic assignment plots. This is likely due to the additional capacity that was provided with the recent SR 28 widening project. As a result, for this section of SR 28, average annual growth rates were calculated for the increase in volumes between 2008 and 2030. The resulting growth rates were applied to the AM peak, PM peak and daily counted traffic volumes to generate the future design year traffic volumes for this section of SR 28.

Future traffic volumes projected using the average annual growth rates described above are shown in Figure 5-1.

Note: The growth in traffic volumes due to development within the development nodes along SR 28, was found to be significantly higher than that which was accounted for in the OKI traffic assignment plots. As a result, additional analyses based on trip generation from the actual projected land uses within the development nodes along the corridor are provided in Section 7.

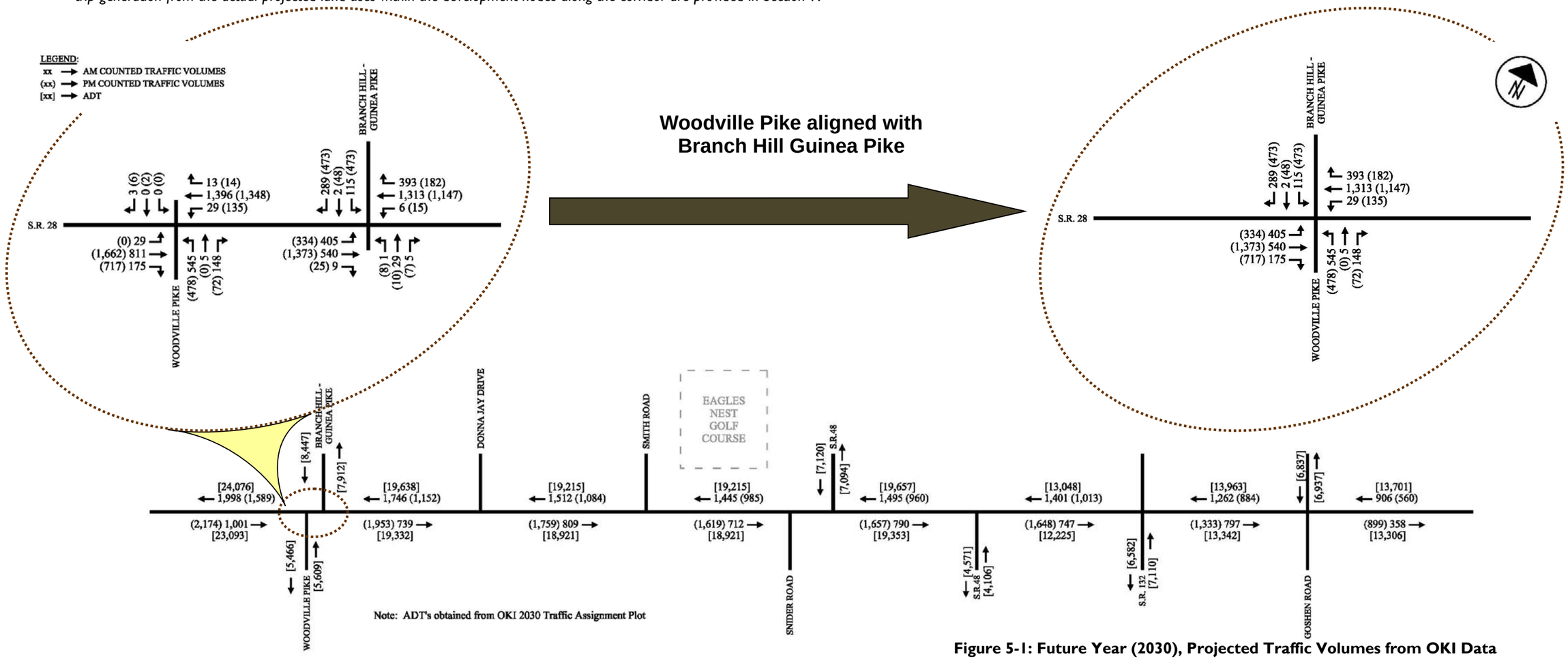


Figure 5-1: Future Year (2030), Projected Traffic Volumes from OKI Data

5.1 TRAFFIC CAPACITY ANALYSES

5.1.1 Future Conditions Capacity Analyses

(Existing Roadway, 2030 Traffic Volumes Based on OKI Traffic Demand Model)

Future conditions capacity analyses were performed on the existing roadway infrastructure using 2030 traffic volumes that were developed using the average annual growth rates as described in the previous section. As indicated previously, intersections or sections of roadway with levels of service of "D" or worse were not considered to be operating acceptably. Reports from each of the Future Conditions Capacity Analyses are included in Appendix D.

Intersection Analyses

Intersection capacity analyses were performed at the intersection of SR 28 and Branch Hill Guinea Pike and at the intersection of SR 28 and Woodville Pike. Table 5A shows the calculated delays and levels of service for each intersection. Based on the analyses, both intersections are expected to experience significant operational problems with unacceptable delays.

		Eastbound			Westbound			Northbound			Southbound			INT.
		LT	THRU	RT	LT	THRU	RT	LT	THRU	RT	LT	THRU	RT	
SR 28 at Woodville Pike	AM	30.1 C	24.2 C		21.7 C	55.2 E		64.1 E	16.7 B		14.8 B			44.6 D
	PM	8.0 A	188.9 F		425.6 F	16.9 B		190 F	24.2 C		22.9 C			140.4 F
SR 28 at Branch Hill Guinea Pike	AM	79.8 E	4.8 A		14.3 B	155.5 F		31.9 C	32.6 C		39.1 D	187.2 F		116.0 F
	PM	67.8 E	17.5 B		26.6 C	168.2 F		23.4 C	22.4 C		169.8 F	141.6 F		103.9 F

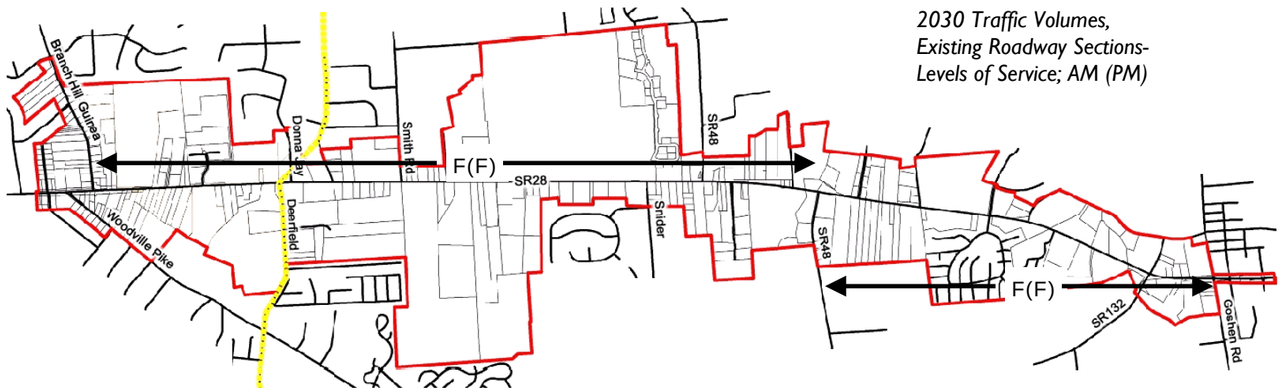
Table 5A: 2030 Existing Intersection Capacity Analyses Summary (based on OKI traffic volumes)

Arterial Roadway Analyses

Capacity analyses were performed on SR 28 within the project area using the Urban Streets methodology as described in Section 4.6. According to the analyses, both the western and eastern sections of SR 28 are expected to operate at unacceptable levels of service under the projected 2030 traffic volumes. Also, the volume to capacity ratios for each section of roadway are expected to exceed 1.00, indicating that the projected traffic volumes exceed the capacity of the existing roadway. Table 5B shows the calculated volume to capacity ratios, average travel speeds, and levels of service for each section of SR 28.

		Volume to Capacity Ratio (v/c)	Average Travel Speed (mph)	Level of Service (LOS)
Western Section SR 28 from Branch Hill Guinea Pike to SR 48 South	AM - Westbound	1.42	14.6	F
	PM - Eastbound	1.60	11.4	F
Eastern Section SR 28 from SR 48 South to Goshen Road	AM - Westbound	1.35	11.3	F
	PM - Eastbound	1.44	9.6	F

Table 5B: 2030 Existing Roadway - Arterial Capacity Analyses Summary



2030 Traffic Volumes, Existing Roadway Sections- Levels of Service; AM (PM)

5.1.2 Future Conditions Capacity Analyses
(Improved Roadway, 2030 Traffic Volumes Based on OKI Traffic Demand Model)

Intersection Analyses

In order to identify what improvements are needed to accommodate the projected 2030 traffic volumes at acceptable levels of service, capacity analyses were performed on the intersections of SR 28 and Woodville Pike/ Branch Hill Guinea Pike. In these analyses, it is assumed that the Woodville Pike approach to the intersection will be relocated toward the east along SR 28 such that it is in alignment with Branch Hill Guinea Pike. It is also assumed that the existing alignment of Woodville Pike will continue to be used by motorists turning right from SR 28.

According to the analyses, the following intersection configuration is needed in order to accommodate the 2030 traffic volumes.

- Eastbound: Four approach lanes (Two left-turn only, one through only, and one through-right shared)
- Westbound: Four approach lanes (One left-turn only, two through only, and one right-turn only)
- Northbound: Three approach lanes (Two left-turn only and one through-right shared)
- Southbound: Four approach lanes (Two left-turn only, one through-right shared, and one right-turn only)

It should be noted that this configuration is based on projected traffic volumes. The actual intersection configuration will need to be determined based on ODOT certified traffic volumes.

Table 5C shows the calculated delays and levels of service for each intersection. It should be noted that the recommended intersection configuration does not meet the level of service criteria outlined in ODOT's *Policy for Applying Level of Service and Volume-to-Capacity Ratio in the Transportation Development Process.* Acceptable levels of service cannot be achieved with an intersection configuration that is considered practical to construct.

		Eastbound			Westbound			Northbound			Southbound			INT.
		LT	THRU	RT	LT	THRU	RT	LT	THRU	RT	LT	THRU	RT	
SR 28 at Woodville/Branch Hill Guinea Pike	AM	77.8 E	19.9 B		19.8 B	58.9 E	20.4 C	72.9 E	50.4 D		64.3 E	57.4 E	57.9 E	52.8 D
	PM	55.3 E	50.1 D		73.3 E	52.6 D	11.9 B	79.6 E	58.5 E		77.7 E	68.1 E	77.3 E	58.9 E

Table 5C: 2030 Improved Intersection Capacity Analyses Summary (based on OKI traffic volumes)

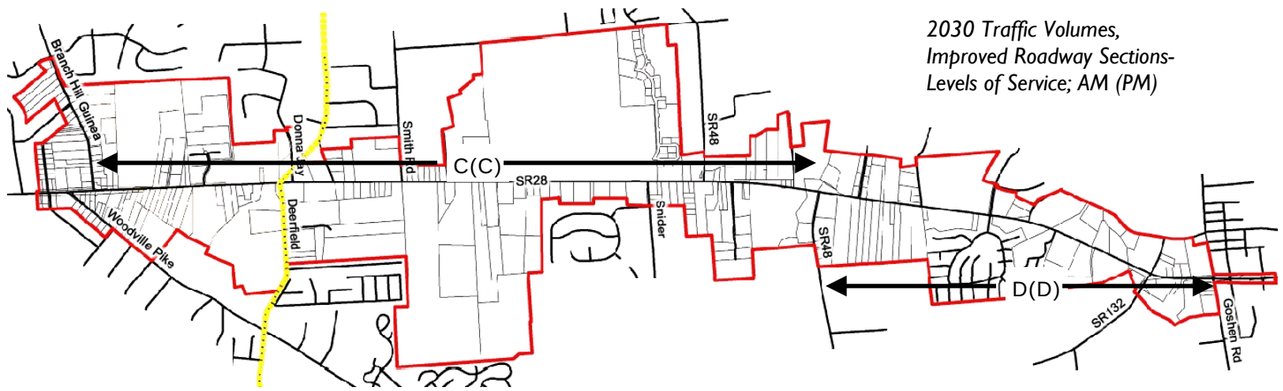
Arterial Roadway Analyses

In order to determine what roadway section is required to accommodate the projected 2030 traffic volumes, capacity analyses were performed using the Urban Streets methodology as described in Section 4.6. These analyses were performed using the assumption that additional traffic signals will be in place at nodal development access points as described in Section 8. According to the analyses, two travel lanes are needed for each direction of travel along the entire length of SR 28 within the project study area. Table 5D shows the calculated volume to capacity ratios, average travel speeds, and levels of service for each improved section of SR 28. Again, it should be noted that the resulting roadway configuration does not meet the level of service criteria outlined in ODOT's *Policy for Applying Level of Service and Volume-to-Capacity Ratio in the Transportation Development Process.* Acceptable levels of service cannot be achieved with a roadway configuration that is considered practical to construct.

The graphics shown to the right represent options for typical roadway configurations needed to handle design year traffic conditions. A divided median is preferable to a two-way left turn lane for the purpose of access management; however, need for a two-way left turn lane should be based on the ability to effectively accommodate and control access to properties along each section of the corridor as the area develops.

		Volume to Capacity Ratio (v/c)	Average Travel Speed (mph)	Level of Service (LOS)
SR 28 from Branch Hill Guinea Pike to SR 48 South	AM - Westbound	0.81	30.7	C
	PM - Eastbound	0.91	29.4	C
SR 28 from SR 48 South to Goshen Road	AM - Westbound	0.77	22.6	D
	PM - Eastbound	0.82	22.2	D

Table 5D: 2030 Improved Roadway - Arterial Capacity Analyses Summary



5.2 SAFETY CONSIDERATIONS

As indicated in the crash analyses, higher than predicted numbers of crashes were reported at the following five intersections within the study corridor.

- SR 28 at Deerfield Road
- SR 28 at Donna Jay Road
- SR 28 at Smith Road
- SR 28 at Snider Road
- SR 28 at SR 48 South

The two main crash types that were identified as being high at these locations were rear-end and right-angle crashes.

Based on the existing roadway configuration within the study corridor, a likely contributing factor for many of the rear-end type crashes that occurred at a higher than expected frequency is the lack of auxiliary left-turn lanes. The recommended roadway configuration throughout the corridor includes either dedicated left-turn lanes or two-way left turn lanes. Providing these areas to store while motorists wait for a gap in opposing traffic should increase the level of safety and driver comfort since left turning vehicles will no longer be waiting to turn in high speed travel lanes.

While the crash patterns at locations where the frequency of rear-end crashes was considered to be high primarily involved left turning vehicles, consideration should also given to the construction of right-turn lanes at intersections where the volume of right turning vehicles is significant or where other factors indicate that a right-turn lane would be appropriate.

At the intersections of SR 28 with Snider Road and with SR 48 South, the number of right-angle crashes was determined to be higher than expected. It is anticipated that each of these intersections will require signalization at some point in the future. Traffic signals at these locations will assign alternating right-of-way to the conflicting approaches of these intersections, allowing motorists to enter the roadway without having to assess the adequacy of gaps in conflicting traffic.

In the public input meeting, comments were received regarding the difficulty that motorists experience in entering SR 28 from various side streets and driveways. With the anticipated development throughout the study corridor, the installation of traffic signals is expected to be needed at various locations to provide for safe and efficient traffic operations. These traffic signals will provide motorists with additional options for entering SR 28. Also, the multi-lane roadway section throughout the corridor will disperse SR 28 traffic more effectively than is possible with the existing two-lane roadway section, which will provide more gaps in traffic for motorists entering SR 28 from various roadways and driveways. In addition, two-way-left-turn lanes throughout the study corridor will allow motorists that are turning left from unsignalized intersections and driveways to make a two-stage left turn, which will reduce the need to find simultaneous gaps in both directions of SR 28 traffic.

5.3 MULTIMODAL TRANSPORTATION RECOMMENDATIONS

The traffic volumes along SR 28 are expected to experience considerable growth in the upcoming years. In fact, at many of the intersections along the study corridor, the SR 28 approaches are anticipated to be operating near capacity in the future design year, even with the recommended improved roadway configurations. In order to limit the number of vehicle trips while encouraging development growth in this area, it is recommended that transit facilities within development areas be provided where possible. It is also recommended that bicycle and pedestrian accommodations be a key component along the SR 28 corridor so that local residents and transit users can have a viable alternate mode of transportation between desired destinations.

The main focus area will be inside the four nodes identified earlier. The first objective is to create pedestrian connectivity between both sides of SR 28 within these nodes. The increased popularity of "lifestyle" retail developments giving suburban areas a compact and pedestrian oriented shopping environment is a popular trend n the marketplace. To make this work within the individual nodes, sidewalk improvements must be made. Wide sidewalks located parallel to SR 28 are encouraged so long as adequate pedestrian safety is maintained. This sidewalk network should strive to connect the activity areas located within each node. Providing bicycle lanes and pedestrian sidewalk areas along the shoulder of SR 28 within identified areas along the corridor in close proximity to residential development clusters will assist in further providing connections between destination based retail and service nodes and nearby residential areas.

Pedestrian safety and crossing SR 28 is a key concern. Crossing 4-6 lanes of traffic is a dangerous situation for persons of any age bracket. Pedestrians walking across turn lanes is also a concern, for both pedestrian safety and traffic backups. It is recommended to create aesthetic and safety enhanced pedestrian crossing points for each node to cross SR 28. This cross connection can provide a pedestrian link in the event the development opposite of the designated node areas grows as a complimentary land use that warrants pedestrian connectivity such as office uses seeking to access the restaurants and other amenities found in the node development areas.

Reducing vehicle trips can be helped by creating walkable nodes, but it is not realistic to walk from one node to another. Creating mass transit stops throughout each node is essential to reduce the number of trips made along the corridor. A bus line or shuttle running in a loop through the corridor is one option. Providing adequate transit facility locations should be included in the local planning and site plan review process.

During the plan design and review phases, attention should be given toward creating a pedestrian friendly environment to support multimodal sites located within and adjacent to new planned developments as shown in these representative photographs.

Multimodal stations can be incorporated in a planned development to continue the aesthetic theming and continuity throughout as depicted above.

5.4 POTENTIAL ALTERNATIVES FOR FUTURE TRAFFIC CONDITIONS

Based on information gathered and analyses performed throughout the course of this study, roadway improvements were identified that would be necessary to accommodate the projected future design year (2030) traffic volumes estimated in this study. The traffic volumes that were generated from the OKI Traffic Demand Model were used as a basis in the identification of these improvements. The potential alternatives also take into account findings from the crash analyses, information received in the public input meeting, and observations of traffic and roadway conditions in the study area.

It should be noted that the analyses performed in this study are based on assumptions related to the anticipated development and traffic patterns throughout the project area. Specific infrastructure needs, particularly at individual nodal development access points, as described in Section 7, will need to be determined via further analyses using ODOT certified traffic volumes.

5.5 GENERAL ROADWAY SECTION

Based on the capacity analyses, it is anticipated that the entire length of SR 28 within the project study area will need to be widened to provide two travel lanes in each direction. The construction of auxiliary left and right turn lanes turn lanes should considered at key intersections both inside and outside the development nodes in order to safely and efficiently accommodate the growing traffic volumes throughout the corridor. The crash analyses revealed higher than normal occurrences of rear-end crashes on SR 28 at Deerfield Road, Donna Jay Drive, and Snider Road. Each of these intersections should be considered for the construction of left turn lanes.

Also, it is recommended that a 45 mph speed limit be considered for SR 28 throughout the entire length of the study area. A single speed limit would provide consistency over the length of the roadway and would more compatible with the type and level of development that is anticipated to occur within the study area.

As widening projects occur within the study corridor, it is recommended that existing driveways be eliminated or combined where possible such that the access points are brought into compliance with ODOT's State Highway Access Management Manual.

5.6 EXISTING INTERSECTION CONFIGURATION

Based on observations of the study area roadway/intersection configurations and comments received from participants in the public input meeting as well as from members of the project team, it is recommended that consideration be given to the Woodville Pike approach to SR 28 being relocated to the east to intersect SR 28 directly opposite Branch Hill Guinea Pike. It is understood that this realignment has been and is currently being considered to be performed in the upcoming years. Aligning these intersections will allow motorists traveling north-south to cross SR 28 through a single intersection as opposed to through two intersections. Also, creating a single intersection of these two roadways will address problems that are occurring or are expected to occur with signal coordination, vehicle queuing and blocking, left-turn storage space between intersections, and safety.

According to intersection capacity analyses, the following intersection configuration is needed at the intersection of SR 28 and Woodville Pike/Branch Hill Guinea Pike in order to accommodate the 2030 projected traffic volumes :

- Eastbound: Four approach lanes (Two left-turn only, one through only, and one through-right shared)
- Westbound: Four approach lanes (One left-turn only, two through only, and one right-turn only)
- Northbound: Three approach lanes (Two left-turn only and one through-right shared)
- Southbound: Four approach lanes (Two left-turn only, one through-right shared, and one right-turn only)

It is also recommended that consideration be given to the realignment of the Deerfield Road/Donna Jay Drive approaches to SR 28. These approaches are currently offset by approximately 225 feet. Also, there are no left turn lanes along SR 28 in the area of these intersections. Vehicles on SR 28 that are waiting for a gap in opposing traffic to turn onto either Deerfield Road or Donna Jay Drive tend to block other vehicles traveling in the same direction. At this location, approximately 10 vehicles queued up behind the left turning vehicle will result in the blocking of the adjacent intersection, which has the potential of causing a gridlock situation. Realigning these approaches will also provide for improved traffic operations if a traffic signal is installed in the future.